Jagadish Kundu

PhD (Engineering Geology)

Postdoctoral researcher at Sapienza Università di Roma

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Research Objective

My aim is to understand the mechanism of Earth-mass behaviour and to apply the obtained knowledge for detection and remediation of instability in soil and rock mass. I am also interested in developing tools and techniques to solve or ease the difficulties related to stability in rock mass.

Research Interests

- Processes involved in slope failures: rockfall, Rockslide, debris slide and their detection
- Photogrammetric techniques and point cloud analysis hill slope investigation
- Improvements to Rock Mass Characterization systems
- Rock mechanics and Rock discontinuity behaviour
- Development of early warning system for rock slope failure

Employment and Education

Assistant Manager (Geology) (Feb 2021-July 2021)	**Gammon Engineers and Contractors Pvt. Limited, Himachal Pradesh, India - 175105**
PhD (May 2015 – Jan 2021)	**Indian Institute of Technology (Indian School of Mines), Dhanbad, India** Department of Applied Geology **Thesis title:** Stability evaluation of hill slopes: New perspectives to rock material and rock mass characterisation **Thesis supervisors:** Prof. Kripamoy Sarkar; Prof. A.K. Verma; Prof. T.N. Singh
MSc (Applied Geology) (2012 – 2014)	**Indian Institute of Technology Bombay, Mumbai, India** Department of Earth Sciences **Thesis title:** Study of shear zone in and around Skandasramam village, Salem, Tamil-Nadu, India. **Mentor** – Prof T.K. Biswal
BSc (Geology) (2009 – 2012)	**Ravenshaw University, Cuttack, Odisha, India**
12th (Science) (2009)	**N.C. Junior College, CHSE, Odisha, India**
10th (Literature, Science and Arts) (2007)	**Darsan High School, BSE, Odisha, India**

Publications

Articles in Journals

1. **Kundu J,** Sarkar K, Verma AK, Singh, TN **(2022)** Novel methods for quantitative analysis of kinematic stability and slope mass rating in jointed rock slopes with the aid of a new computer application. *Bull Eng Geol Environ.* 81, 29.
2. Singh AK, **Kundu J,** Sarkar k, Verma H.K., Singh, P.K. (**2021**) Impact of rock block characteristics on rockfall hazard and its implications for rockfall protection strategies along Himalayan highways: a case study. *Bull Eng Geol* Environ. Vol. 80, pp. 5347–5368.
3. **Kundu J,** Sarkar k, Singh AK, and Singh TN (**2020**) Continuous functions and a computer application for rock mass rating. *Int. J. Rock Mech. Min. Sci.* vol. 129, 104280.
4. **Kundu J,** Mahanta B, Sarkar K, and Singh TN (2018) The Effect of Lineation on anisotropy in dry and saturated Himalayan schistose rock under Brazilian test conditions. *Rock Mech Rock Eng.*, vol. 51 (1). pp. 5-21.
5. **Kundu J,** Sarkar K, Singh PK, and Singh TN (2018) Deterministic and Probabilistic Stability Analysis of soil slope - A Case Study. *J. Geol. Soc. India*. vol. 91, pp. 418-424.
6. Singh AK, **Kundu J,** and Sarkar K (2018) Stability Analysis of a Recurring Soil Slope Failure along NH-5, Himachal Himalaya, India. *Nat. Hazards*, vol. 90 (2), pp.863-885.
7. **Kundu J,** Sarkar K, Tripathy A, and Singh TN (2017) Qualitative stability assessment of cut slopes along the national highway- 05 around Jhakri area, Himachal Pradesh, India. *J. Earth Syst. Sci.*, vol. 126, pp. 112.
8. **Kundu J,** Sarkar K, and Singh TN (2017) Static and dynamic analysis of Rock slope - a case study, *Procedia Engineering*, vol. 191, pp. 744-749.
9. Buragohain B, **Kundu J,** Sarkar K, and Singh TN (2016) Stability Assessment of a Hill Slope-An Analytical and Numerical Approach. *International Journal of Earth Sciences and Engineering*, vol. 09 (03) pp. 269-273.
10. Tripathy A, Singh TN, and **Kundu J** (2015) Prediction of abrasiveness index of some Indian rocks using soft computing methods. *Measurement*, vol. 68, pp. 302.

Articles/Abstract(s)/poster(s) in conferences

1. **Kundu J,** Sarkar K, Jaboyedoff M and Singh TN. (2019) GISMR: A Computer Application to Perform Kinematic Analysis, Slope Mass Rating and Optimization of Slope Angle on a GIS Platform with the Aid of ArcGIS or QGIS. In: AGU Fall Meeting 2019, 09–13 Dec 2019, San Francisco, CA, USA. (Oral)
2. **Kundu J,** Sarkar K, and Singh AK (2019) EasySMR: A computer program to check kinematic feasibility and calculate Slope Mass Rating. In: in the EGU General Assembly 2019, 07–12 Apr 2019, in Vienna, Austria. (Poster)
3. Nath S, **Kundu J,** Singh AK, Acharya B, and Sarkar K (2018) Lithological control on joint roughness. Emerging Trends in Geophysical Research for Make-in-India (ETGRMI) Abstract volume; 9-11 March 2018, IIT(ISM) Dhanbad, pp. 149-151.
4. **Kundu J,** Sarkar K, Buragohain B, Kumari D, and Tripathy A (2017) Stability Analysis of Weathered Rock Mass with Soil Cover—A Himalayan Case Study, In: Fourth Indian Landslide Congress Abstract volume; 8-9 December 2017, IIT Bombay, India. (Oral, Best Paper Award)
5. **Kundu J,** Mahanta B, Tripathy A, Sarkar K, and Singh, TN (2016) Stability Evaluation of Jointed Rock Slope with Curved Face, In: Indorock 2016, June, IIT Bombay, India pp. 971–978. (Oral)

6. **Kundu J,** Sarkar K, and Singh AK (2016) Integrating structural and numerical solutions for road cut slope stability analysis case study, India, in: Rock Dynamics: From Research to Engineering. CRC Press, Suzhou, China, pp. 457–462.
7. Acharya B, **Kundu J,** Sarkar K, and Chawla S (2017). Stability Assessment of a Critical Slope near Nathpa Region, Himachal Pradesh, India, In: IGC 2017 GeoNest Proceedings, 14-16 December 2017, IIT Guwahati, India.

Award(s) and Grant(s)

- Best paper award at Indian Landslide Congress 2017, IIT Bombay, Mumbai
- International Travel Grant from SERB, Department of Science and Technology, Government of India, 2019
- AGU Fall Meeting General Student Travel Grant 2019.
- Geohost (SRSP) award to attend 36th International Geological Congress 2020.

Scholastic Achievements

- Secured All India Rank-156 in GATE, 2015
- Qualified Junior Research Fellowship conducted by CSIR-UGC (NET), June 2014, Rank-93
- Secured All India Rank 36 in IIT-Joint Admission for M.Sc. Examination, 2012
- Secured 5th position on merit basis in Ravenshaw University, Cuttack, 2012

Workshops, training and courses

- 14 days' workshop at IRALL School 2019, CDUT, China (20th Oct to 02nd Nov 2019)
- 21 days' training programme the 21 Days summer School on Geospatial Technologies Level 2 (Mountain Disaster Management - Landslides) organised by Department of Science and Technology, Government of India, May 2019
- Three days training cum field workshop on numerical simulation of landslide studies, 15-17, 2018, ISM Dhanbad
- A Three-Day Workshop on Design & Style of a PhD Thesis and reference management using Open-Source Solutions, April 06-08, 2018, at IIT (ISM) Dhanbad
- Four days' Training Programme on Application of Numerical Simulation for slope stability risk mitigation and management, February 15-18, 2018
- Attended Introductory training on EDEM at IIT(ISM) Dhanbad, 28-29 October 2017
- Participated in the workshop on 'Dimensioning of TECCO®-Slope Stabilization System with RUVOLUM® Online Tool/Rockfall Protection, Landslide and Debris Flow Measures', held at Department of Earth Sciences, Indian Institute of Technology, Bombay, on 17th September, 2014
- Training On Rock Slope and Rock Engineering (45 Days), at IIT Bombay, Mentor: Prof T.N. Singh 2014
- Master Dissertation project on Study of Salem -Attur shear zone, Tamil Nadu, 2014
- Twelve days training on "Exploration for Uranium" in AMD at M.C. Palle camp, Kadapa district, A.P, India, 2013
- Participated in the workshop on 'Theory of pore-pressure and fracture-pressure prediction in petroleum industry', held at Department of Earth Sciences, Indian Institute of Technology, Bombay, on 28th January, 2013

- Detailed mapping and structural study of fault propagation folds and stratigraphic interpretations of Cenozoic beds in Kutch and surrounding area, Gujarat, India (10 days, December 2012)

Technical Skills

- Languages: C, C++, C#
- Slope stability analysis software: RS^2, RS^3, Slide, Dips, Unwedge, Swedge, UDEC, FLAC 2D, Plaxis
- Rock mass characterisation: RMR, Q, GSI
- Engineering geological investigation and mapping
- Face and 3D logging of tunnel
- Proficiency in geotechnical testing: Uniaxial Compressive Strength, Point Load Index Strength, Indirect Tensile Strength, Shear Strength by Triaxial and direct shear Test, P & S wave velocity, Slake durability Index, Physical Properties of rock and soil
- Simulation skill in COMSOL Multiphysics
- Remote sensing software: QGIS, ArcGIS
- Digitising software: AutoCAD, CorelDraw, Adobe illustrator

Additional Activities

- Program coordinator at Four days training programme on Application of Numerical Simulation for slope stability risk mitigation and management, February 15-18, 2018
- Student Coordinator at Indian Landslide Congress 2017, IIT Bombay, Mumbai
- Programme coordinator and volunteer at Karma Jyoti, CSM, IIT (ISM) Dhanbad (2017 – 2020)
- Volunteered at Team SAHAYOG at IIT Bombay, Mumbai 2015
- volunteered in cultural event organised by UTKALA at IIT Bombay, April 2013-April 2015
- Voluntary teacher of NRO at Shree Jagannath Seva Mandal, Sakinaka, Mumbai 2014
- Organiser in Mood Indigo-2012 in the department of Hospitality and Public relation, Mumbai